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Research Space Factors Used for Projecting the 1969-71 Needs in Wisconsin Public Higher Education Facilities.

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The demand unit approach to determining research space needs is proposed as a method for projection of space required for research in Wisconsin public higher education facilities. Discussion is directed to the two factors utilized in implementation of this approach, namely, (1) the varying level of activity devoted to research by participating personnel, and (2) the varying amounts of space required for different types of academic programs. It is noted that this approach can serve to determine the space needed for most research activities, however, there are certain special research programs which must be treated separately on a case-by-case basis. (FS)

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APPROVED

For Action

CCHE #97, July 1968

RESEARCH SPACE FACTORS USED FOR PROJECTING THE 1969-71 NEEDS IN WISCONSIN PUBLIC HIGHER EDUCATION FACILITIES

INTRODUCTION Research has been one of the essential hallmarks of the University of Wisconsin-Madison for many decades. It has now become an integral educational function of the Wisconsin State University system and the several new campuses of the University of Wisconsin established in the 1950's and 1960's. The first ingredient for conducting this research is a highly competent faculty. Secondly, this faculty must be housed in appropriate and adequate space and be supplied with up-to-date equipment and tools.

This paper is concerned with the second of these ingredients--planning for and supplying adequate and appropriate space. The projection of space required for research is a process which has posed difficult problems for educational administrators over the years. Supplying appropriate allowances for current programs is complicated enough, but it is even more difficult to estimate future requirements in the face of changing technology and the dynamic revisions in scholarly research methodology. But rules of thumb will no longer suffice. We must find better techniques which will give us both realistic and flexible guidelines for both current and future programs.

In 1966 the staff proposed a concept for a research space guideline. After considerable discussion, action on CCHE Working Paper #60 was received pending further investigation and testing of its basic approach and the factors used in this approach for calculating space needs.

The approach proposed at that time (which is a technique similar to that in use in several other states) was based on the concept that space needed for research is related to the areas of: 1) the varying level of activity devoted to research by participating personnel, and 2) the varying amounts of space required for different types of academic programs.

THE LEVEL OF RESEARCH ACTIVITY This factor refers to the different kinds of persons involved in research programs, ranging from participating full professors to the technical and administrative personnel in the laboratories. This level of research activity can be expressed in terms of the units of demand for research space generated by each kind of research staff member:

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A. Full-time equivalent teaching faculty--3 demand units;

B. Full-time equivalent research faculty and staff--15 demand units;

C. Master's degree enrollees--3 demand units;

D. Doctoral degree enrollees--12 demand units;

E. Post-doctoral fellows--15 demand units.

These research demand unit assignments are based on studies of the relative percentages of time devoted to scholarly research by these personnel. Full-time research activity is equated with 15 demand units. It was found that teaching faculty and master's degree students devote 20% of their time to research, and doctoral students 80% of their time. Thus they are assigned 3 and 12 demand units, respectively.

RESEARCH SPACE REQUIREMENTS It is obvious that the various subject fields will require substantially differing amounts of space. For broad building program review, however, the several disciplines can be assigned to broad categories of the research function. For this purpose six categories have been established. These categories and the net assignable space values assigned to them are listed below:

Humanities--3
Social studies--8
Physical sciences--29
Life science--28
Engineering--31
Agriculture--33

The various subject fields assigned to the function of research are shown in Appendix A.

Thus by *multiplying* the demand for space generated by each kind of staff member (expressed in demand units) *by* the amounts of space required by the various subject fields, we can determine the total space needs for research programs.

Since 1966 both the University of Wisconsin and the State University system have tested this basic approach. In the case of the University of Wisconsin a number of departments on the Madison campus were

requested to estimate their space needs first using professional judgment and then independently applying the demand unit/space factor approach. Surprisingly, the two methods produced rather similar results. In addition, the University tested out the net assignable square foot element of the formula by applying the demand unit concept against existing net assignable square footages. The results produced factors which were surprisingly close to the 1966 space factor figures. In fact, when specialized facilities were eliminated from the square footage calculations, the proposed demand unit/space factor formula produced less than 10% more space than now exists. This demonstrates that the proposed formula is a reasonably accurate reflection of professional judgments of research space needs. While there were individual instances of departments where the space factors seemed not to meet their needs, in general the proposed figures turned out to be surprisingly realistic for broad program review purposes.

Because of the absence of a research space guideline and little historical experience on which to base a judgment, a factor of 36 square feet per FTE student was previously used to estimate space needs at UW-M. Significantly, however, *use of the demand unit formula proposed here showed UW-M's research space requirements to be 23% less* than the 36-square-foot figure produced.

In a recent study the Wisconsin State Universities applied the proposed research space guidelines to their needs for research space. It was found that the projection of space that resulted by use of the research demand unit/space factor concept was appropriate for estimating WSU research space needs. Furthermore, the proposed numerical values for demand units by categories of faculty-staff and the proposed numerical values for space factors by categories of subject fields were found to be acceptable for use in the development of the 1969-71 building program.

A newer program of research such as that developing in the State University system requires the establishment of core facilities.

The system's studies show that the proposed technique allows for the planning of research facilities that are consistent with the requirements of new programs to be initiated in the State University system during the next several years. It is important to emphasize that while the proposed numerical values for demand units and space factors are suitable for the current biennium, *they must be further refined* so that they will continue to be appropriate for the development of facilities to accommodate maturing research programs in the State University system.

In summary, review and testing of the demand unit approach to determining research space needs has demonstrated its appropriateness for this purpose. It will not greatly increase estimated space needs, compared to other approaches. In the case of UW-M it produces less, but still adequate, estimated research space. Several future refinements appear to be desirable:

1. The need to further differentiate academic subject areas, their assignment to research groupings, and the space allotted to each grouping;
2. The need to accommodate varying demand for research space by campuses;
3. The need to assure that the formula remains useful for both achieving a core of research space for developing programs and a continuing adequate amount of space to accommodate mature research programs.

SPECIALIZED RESEARCH SPACE NEEDS While the research space guidelines described here can serve to determine the space needed for most research activities, there are certain special research programs which must be treated separately. These programs, like the biotron or the primate laboratory, are highly specialized and provide services to the entire Midwest region, or like the computer laboratory, provide service for the entire University system. There are one-of-a-kind types of programs, such as a nuclear accelerator or a pollution research program, which are so highly specialized that only one such facility will ever be required. In these instances space needs for such functions must of necessity be determined on a case-by-case basis.

RECOMMENDATION In view of the examination given to the proposed research space guideline by the two systems, the staff and the Physical Facilities Technical Advisory Committee recommend approval of the demand unit approach to determining research space needs expressed in this document. At the same time, we recognize that this is a beginning step in the use of such an approach. We propose that the factors used be reviewed biennially to assure that this formula responds adequately to changing technology and research methods. This review would include the demand unit values, the net assignable square footages per demand unit, and the assignment of academic disciplines to broad categories.

APPENDIX A

Agriculture

Agronomy
Dairy & Food Industries
Dairy Science
Foods & Nutrition
Forestry
Horticulture
Landscape Architecture
Meat & Animal Science
Plant Pathology
Poultry Science
Veterinary Science
Wildlife Management

Engineering

Agricultural
Chemical
Civil
Electrical
Graphics
Mechanical
Mechanics
Minerals & Metals
Nuclear

Humanities

African Languages
& Literature
Art History
Chinese
Classics
Comparative Literature
English
French & Italian
German
Hebrew & Semetic Studies
History of Science
Indian Studies
Library Science
Linguistics
Mathematics
Music
Philosophy
Related Arts
Scandinavian Studies
Slavic Languages
Spanish & Portuguese
Speech

Life Science

Bacteriology
Botany
Entomology
Genetics
Zoology

Physical Sciences

Astronomy
Biochemistry
Chemistry
Geology
Meteorology
Pharmacy
Physics
Soils

Social Studies

Agricultural Economics
Agricultural & Extension Education
Agricultural Foundation
Anthropology
Art & Art Education
Commerce
Counseling & Behavioral Studies
Curriculum & Instruction
Economics
Education Administration
Educational Policy Studies
Educational Psychology
Geography
History
Home Economics & Ext. Education
Home Management & Family Living
Journalism
Law
Physical Education
Politcal Science
Psychology
Rural Sociology
Social Work
Sociology
Textiles & Clothing
Urban & Regional Planning